DOCUMENT RESUME

ED 463 645 EF 006 078

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TITLE	Teachers as Placemakers: Investigating Teachers' Use of the Physical Learning Environment in Instructional Design.
PUB DATE	2002-00-00
NOTE	10p.
AVAILABLE FROM	For full text: http://schoolstudio.engr.wisc.edu.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Class Organization; *Classroom Design; Classroom Environment; Classrooms; Elementary Secondary Education; *Teacher Behavior; Teachers

ABSTRACT

This paper summarizes research conducted to assess how and to what extent teachers actively use and manipulate the physical classroom learning environment as part of their instructional design. A structured interview and participant observation were used to gather data from several teachers at all grade levels, including national board certified teachers. Preliminary findings include the design principles used by various teachers, which indicate that rather than receiving education on research-based design principles during their formal education, teachers have relied on trial-and-error methods. (Contains 19 references.) (EV)

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ED 463 645

Teachers as Placemakers: Investigating Teachers' Use of the Physical Learning Environment in Instructional Design

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This paper presentation will summarize research the authors have conducted to assess how and to what extent teachers actively utilize and manipulate the physical classroom learning environment as part of their instructional design. It is difficult, if not impossible, to separate instructional activity from the physical environmental setting within which it occurs. The relationship between the physical learning environment on behavior and attitudes of both teachers and students is well documented (Gump, 1987; McGuffey, 1982; Weinstein, 1979). However, research investigating the role of the physical classroom setting as a part of instructional design is minimal (Loughlin & Suina, 1982; Pellegerini & Perlmutter, 1989). The classroom temperature, lighting and air quality would appear to have some effect on the learning environment (McGuffey, 1982). In addition, the cleanliness, orderliness and character that a facility exudes is perceived by teachers to influence children's behavior (Lackney, 1996). Further, the arrangement of furniture and the allocation of spaces within the classroom can greatly affect what can be accomplished within a given instructional setting (Weinstein, 1981).

Teachers generally believe that they have some measure of responsibility, influence, and control over their learning environment (Lackney, 1996). They also believe that the learning environment can have both positive and negative effects on their ability to teach and student's ability to focus on learning tasks. To a great degree, teachers feel that have a significant control over classroom adaptability, instilling a sense of personalization and ownership within their students. Many teachers attempt to create learning environments that foster healthy social interaction (Loo, 1972), provide places

EF 006 078

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for student privacy (Moore, 1986), as well as facilitate and maintain an appropriate level of sensory stimulation.

Yet, paradoxically, the researchers postulate some teachers lack adequate knowledge about effectively creating and managing classroom space to support their instructional efforts (e.g., group projects and cooperative learning strategies). Further, educators have disparate perspectives on classroom arrangements. Open instructional areas are perceived as being too distracting and noisy by some teachers, while self-contained classrooms perceived as too constraining and restrictive. In addition, teachers may have a real or perceived lack of efficacy over their physical classroom. They may expect their school administrators to address these issues through appropriate educational policy.

Further, the researchers postulate that the knowledge acquired by teacher practitioners about the role and impact of the physical setting on learning is gained from direct experience through trial and error experimentation and informal communication among their peers. A more systematic educational model needs to be explored to equip educators with the skills needed to maximize the potential and opportunities that the physical setting could afford them to enhance the efficacy of their instruction. A new teacher-training model must prepare teachers to become environmentally competent "placemakers" (Schneekloth & Shibley, 1995) for student instruction and learning. However, before this model can be developed, the researchers propose that the first step is to establish a conceptual model of the way teachers presently use and manage the physical environment in their instructional curriculum.

The issues that this new training model must address are complex and systemic. Many teachers and administrators tend to focus on pedagogical and interpersonal issues, ignoring the physical-spatial context in which the teaching-learning process occurs (Loughlin & Suina, 1982; Weinstein, 1981). The physical environment of the classroom is often neglected as an integral component of the instructional design that should reflect learning objectives and teaching methods. While great strides are being made to integrate technology and other educational media into the curriculum, the physical setting that houses both the technology and the instruction may actually impede and delimit the effectiveness of the implemented technology. Ironically, the classroom arrangement may remain unchanged despite changes in teaching strategies. As a result, the educational

program and the setting in which that program takes place are often in conflict with each other hindering both teaching and learning.

Classroom Arrangement

The majority of the research on the physical learning environment of the school reflects the era of open education and open plan schools. As a result, much of the research is framed within the historic debate between traditional and open classroom arrangements. Research has focused primarily on student behavior in relationship to various physical dimensions of the classroom such as seating position, classroom furnishing arrangement, spatial density, privacy, noise and acoustics, climate and thermal control, windowless classrooms, vandalism and playyards (Gump, 1987; McGuffey, 1982; Weinstein, 1979). As indicated earlier there is very little research on teacher as placemaker of the classroom. Of the various physical dimensions that have been researched, classroom furnishings arrangement appears to be the most salient dimension for supporting curricular objectives.

Traditionally, classroom arrangement is dichotomized according to territorial (space organized by individual desk ownership) or functional (space organized by a specific activity) considerations. Educators have often assumed that row-and-column arrangements, the most common form of territorial classroom arrangement, more appropriate for didactic teaching strategies while functional arrangements, e.g. learning centers, facilitate student-centered, cooperative learning strategies. However, for the investigators' informal observations a classroom may contain elements of both territorial and functional styles depending on the instructional design, although typically one arrangement will dominate over the other.

Territorial Arrangement

In territorial arrangements, physical space is partitioned into islands of student-owned space. That is, each student is assigned a desk in which to store personal belongings. This type of spatial arrangement is often thought to be appropriate for lecture instruction to a whole class and is used most often in classrooms with older children.

Research on seating position in row-and-column arrangements suggests that front-center seat facilitates achievement (Schwebel & Cherlin, 1972), positive student attitudes

toward school and self (Walberg, 1969) and class participation (Adams & Biddle, 1970). The desk design, though, may also have a dramatic effect on learner behaviors depending on whether students are placed at a standard desk/chair combination or carrel/free chair combination that provides an increased sense of privacy.

If teachers elect row and column desk arrangements, they are encouraged to pay attention to student behavior in row-and-column arrangements, making special effort to move around the room and direct comments to all students. Periodically, teachers are advised to change seating patterns, encourage students sitting in the back rows to come forward, and reflect on a student's choice of seating as a potential indicator of a student's self-esteem and interest in learning (Weinstein, 1981).

A caveat though should be noted. The territorial arrangement is not always synonymous with row-and-column arrangements. Territorial desks can be clustered into small groups to facilitate a more cooperative learning, instructional teaching strategy. However, when working in small groups, the territorial arrangement can be either a hindrance or a facilitator to instructional effectiveness.

Functional Arrangement

In functional arrangements, the physical space is divided into common interest areas or learning centers available to all students. This type of spatial arrangement is typically used for small groups of students working on a variety of different activities. Early childhood and open classrooms are examples of this type of functional arrangement.

Research on functional arrangements suggests that spatial arrangement can have an influence on a young learner's location, play activities, and social interaction. Well-defined activity areas can have a positive influence on social interaction and on on-task behaviors (Moore, 1986). Teachers using this style of spatial arrangement must take several variables into consideration for behavioral contingency management due to the increased responsibility placed on the student for self-discipline.

Specific design and management strategies teachers may need to consider in functional arrangements would include: clearly delineating interest areas, locating interest areas in parts of the room that supports that specific activity, e.g. play or reading, separating incompatible activities, making areas visually accessible, providing clearly

defined pathways between areas, making materials easily accessible, and providing a variety of spatial options for privacy, as well as small group or large group work (Weinstein, 1981).

In addition to incorporating different strategies for grouping learners by either self-selection or teacher-selection, varying spatial arrangement within group arrangements can also play a role in the success of a small group activity. Research evidence suggests that spatial relationships among group members can influence the communication patterns in the group (Sommer, 1967), relative status of group members and emergence of a leader (Howells & Becker, 1962) and feelings of affiliation or solidarity that members feel toward one another (Mehrabian & Diamond, 1971).

In forming functional management strategies teachers might consider placing potential group leaders in visible positions, positioning quiet learners opposite the group leader or a more vocal group leader, and moving overly vocal members adjacent to the designated leader to reduce the potential for negative nonverbal communication and eye contact that may inhibit their participation (Weinstein, 1981).

The researchers postulate that teachers may have limited resources with which to manipulate the physical dimension of the classroom. For instance, teachers may be faced with arranging groups using desks not originally designed for group work. The research.ers expect to find that the most successful teachers make creative use of the resources at hand to support their curricular objectives.

Research Methods

Recognizing that there is a range of effectiveness with which teachers integrate the physical setting into their instructional designs, this paper explores research conducted with National Board certified teachers use physical design and management strategies to support their instructional objectives.

A purposive sample of twenty National Board certified teachers was selected. Methods of data collection were structured interview and participant observation in the classroom. A set of interview questions were developed and used to probe teachers use and understanding of physical design in their instructional planning. For each initial interview, the investigators conducted a total of 2 hours of observations of each teacher to triangulate and validate the teachers' interviews. The observations, in addition to the

initial interview of each teacher, informed the second follow-up interview to clarify any discrepancies between the interview and the investigator's observation of the teacher's classroom. Investigator, theory and data triangulation (Denzin, 1978) and interdisciplinary triangulation (Janesick, 1994) were followed by using interview and observation to provide the rigor and validity necessary to ensure confirmability of each informant's perspective.

The interview and observation data were analyzed using a constant-comparative analysis method (Janesick, 1994; Lincoln & Guba, 1985). An initial interview and observations were conducted as well as a closure interview to verify interview data and preliminary findings. The data was categorized and developed into emerging hypotheses for subsequent data collection.

The participants for the study included National Board Certified Teachers and an equal number of teachers not currently holding that national certification in the State of Mississippi. Selection of participants will follow a purposive sample (Lincoln & Guba, 1985) of Mississippi's 62 National Board certified teachers. A total of 12 teachers were selected with an equal representation from elementary, middle and secondary.

Emergent Themes

The following are some preliminary findings from the case studies.

Tanisha's Design Principles for 1st Grade

- Room arrangement should generally have wide open space because "bigger is better." with storage that does not interfere with space in the room.
- Room arrangement should follow the general rules of the prescribed reading program with furniture and equipment that is flexible.
- Room arrangement should be "bright and outgoing" as well as feel "homey" with a carpet and rocker.
- Room arrangement should facilitate partner and group work with desks clustered together but also facilitate children working on the floor if the activity requires more space than a desk.
- Room arrangement should facilitate social success among children as well as

academic success.

Laura's Design Principles for 2nd Grade

- Should facilitate hands on learning through discovery and inquiry based teaching with learning centers.
- Should facilitate community building among children and teachers.
- Should have storage and organizational space that compliments the need for floor space.
- Should contain "alcoves" for children to retreat in small groups for activities.
- Should have less structured activity than older grades allowing children to choose activities.
- Should vary room arrangement according the children's development and curriculum theme or topic of inquiry.
- Should provide flexible furniture and equipment.
- Should have more spacious rooms as grade level increases.

Ginger's Design Principles for 3rd Grade

- Should make full use of all floor and wall space and allow for displaying children's work without wasting space.
- Should be acoustically quiet but colorful and exciting to promote interest and learning.
- Should permit access to the outdoor environment or "outdoor classroom" to extend activities.
- Should provide quality "private" teacher space for teacher/student or teacher/parent conferences.
- Should include accessible restrooms and water fountain to minimize interruptions.
- Should provide flexible furniture and equipment with space to circulate as children are working.

Preliminary Conclusions

Each of these teachers has a particular philosophical orientation toward teaching which influences their curricular decisions. Through that orientation, they received teacher preparation training in curriculum and instructional design. However, each teacher shared that their pre-service training did not prepare them for the challenges of making the physical classroom setting complementary to the curriculum. In particular, issues regarding the physical school context, prescribed instructional programming, variability in child behavior, and personal needs create unique logistical challenges that either were not or could not be addressed in formal education.

On the other hand, their formal teacher education training seemed to be remiss in conveying basic design principles predicated on empirical research. These teachers, instead, have relied on trial and error experiential methods to develop a cogent set of design principles intrinsic to their teaching style and teaching context. Teacher preparation programs must create authentic in-service opportunities for students to gain practical experience in physical manipulation of the classroom within a reasonably broad range of classroom settings.

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